Original Article

"A Study to Assess the Effectiveness of Hot Fomentation Versus Topical Heparin Application on Infusion Induced Phlebitis Among Patients on Intravenous Therapy Admitted at G.G.S Medical College and Hospital Faridkot, Punjab".

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ABSTRACT

Introduction: In healthcare setting, peripheral intravenous catheter (PIVCs) is a critical tool in the delivery of patient care. Phlebitis is the most common complication associated with peripheral intravenous catheters (PIVCs) and accounts for considerable iatrogenic morbidity.

Aim of the study : To assess the effectiveness of hot fomentation versus topical heparin application on infusion induced phlebitis among patients on intravenous therapy admitted at G.G.S Medical College and Hospital, Faridkot Punjab. Material & Methods: A quasi experimental research design was used to conduct the present study. Purposive sampling technique was used to select 60 subjects with phlebitis score 3 and 4 (V.I.P Scale). The basic clinical profile datasheet and Visual Infusion Phlebitis Scale was used to assess the infusion induced phlebitis among patients on intravenous therapy.

Results: The study findings revealed that when mean phlebitis score for both interventions were compared on day one there was no statistical significant difference found in both the interventions. In hot fomentation group (E), after intervention the mean phlebitis score was reduced from 3.50 to 1.63 on 3th day and 0.57 on 5th day. On the other hand, in topical heparin application group (C), after intervention mean phlebitis score reduced from 3.50 to 2.33 on 3rd day and 1.27 on 5th day respectively. Thus when both the interventions are compared hot fomentation is more effective intervention in treating infusion induced phlebitis as compared to topical heparin application.

Key words: Hot Fomentation, Topical Heparin Application, Infusion Induced Phlebitis.

INTRODUCTION & BACKGROUND OF THE STUDY

Peripheral venous catheterization is a common procedure carried out in hospital to allow rapid and accurate administration of medication.[1] However, the placement of an intravenous catheter can have undesirable effects, the most common of which is phlebitis. Peripheral catheter-related phlebitis is caused by the inflammation of the tunica intima of a superficial vein. The inflammation is due to irritation of the tunica intima by mechanical, chemical or bacterial sources. If left untreated, it can lead to infection or thrombus formation.[2] It is estimated that in India 20-80% of patients with peripheral venous catheter develop phlebitis. A study conducted by S R Arai to determine the incidence of peripheral intravenous therapy-related phlebitis in an adult population, results of study showed that phlebitis rate was 63.2 %.[5]In spite of all the advances in medical technology, complications have increased to alarming proportions. It is apparent that standards of care and techniques need to be improved through the exchange of ideas, experience, knowledge and research.[7]

OBJECTIVES

1. To assess the infusion induced phlebitis among patients on intravenous therapy.
2. To evaluate the effectiveness of hot fomentation on infusion induced phlebitis among patients on intravenous therapy.

3. To evaluate the effectiveness of topical heparin application on infusion induced phlebitis among patients on intravenous therapy.
4. To compare the effectiveness of hot fomentation versus topical heparin application on induced phlebitis among patients on intravenous therapy.

MATERIAL & METHODS

Research Approach : An experimental approach.

Research Design: Quasi experimental design.

Setting of the Study : Guru Gobind Singh Medical College & Hospital , Faridkot, Punjab.

Population of the Study : Patients on intravenous therapy admitted at G.G.S Medical College and Hospital Faridkot, Punjab.

Sample and Sampling Technique : Sample for the present study included patients admitted at G.G.S Medical College and Hospital Faridkot, who fulfilled the inclusion criteria .The sample size was 60 patients with grade 3 and grade 4 phlebitis (V.I.P Scale) selected purposefully on the basis of availability and their willingness to participate in the study.

Development of Tools : Tool was selected and developed by keeping in mind the objectives of the study, reviewing theoretical sources, previous studies, internet and through discussions with guide and co-guide. Content validity of tool was determined by the expert's opinion the tool was given to the 10 expert in the field of medical and medical surgical nursing respectively and language expert in English, Punjabi to ascertain the content appropriateness, clarity and relevance.

Tool 1: Basic and clinical profile data sheet, It consisted of 13 items i.e. age, gender, CR number, diagnosis, date of admission, date of insertion of I/v catheter, duration of peripheral infusion, catheter size, catheter localization, infusion solution ,length and severity of infusion solution, there any other anticoagulants/ anti platelets medication prescribed.

Tool 2 : Visual infusion phlebitis scale

Tool 3 : Phlebitis Healing Evaluation Tool

RESULTS

Table 1 Mean, Standard deviation and paired 't' test of phlebitis score for the effectiveness of hot fomentation on infusion induced phlebitis among patients on intravenous therapy.

N= 30

Hot Fomentation (e)	ME AN ± SD	't' test value and df	p-value
Pre intervention	3.50 ±.509	t=17.8 95 df= 29	0.0 00*
Post intervention 3rd day	1.63 ± .615		
Post intervention 3rd day	1.63 ± .615	t=12.9 90 df= 29	0.0 00*
Post intervention on 5th day	0.57 ±.568		

0.000***=Highly Significant

Table No. 1 depicts that the effectiveness of hot fomentation on infusion induced phlebitis among patients on intravenous therapy. It is evident from the table that, after intervention the mean phlebitis score was reduced from 3.50 to 1.63 on 3th day and 0.57 on 5th day. In order to explore the effectiveness of hot fomentation on infusion induced phlebitis, paired 't' test was used, the values found to be 17.895 and 12.99 and p value was .000 which is highly significant at $p<0.05$.

It is seen from the scores that the use of hot fomentation is effective in reducing phlebitis score among patients on intravenous therapy.

Table No. 2 Mean, Standard deviation and paired't' test of phlebitis score for the effectiveness of topical heparin application on infusion induced phlebitis among patients on intravenous therapy.

N=30

Heparin application (c)	MEAN± SD	't' value & df	P value
Pre intervention	3.50±.509	t=16.8 58 df=29	0.000 ***
Post intervention3rd day	2.33 ±.479		
Post intervention 3rd day	2.33±.479	t=12.9 90 df= 29	0.000 ***
Post intervention 5th day	1.27 ±.521		

***=Highly Significant

Table No. 2 depicts the effectiveness of topical heparin application on infusion induced phlebitis among patients on intravenous therapy. As per assessment after intervention mean phlebitis score was reduced from 3.50 to 2.33 on 3rd day and 1.27 on 5th day. In order to explore the effectiveness of topical heparin application on infusion induced phlebitis, paired't' test was used, the values found to be 16.858 and 12.990 p value was .000 which is highly significant at $p<0.05$.

It is seen from the scores that heparin application was also effective in reducing phlebitis score among patients on intravenous therapy.

Table No. 3 Repeated measures ANOVA of Hot Fomentation (E) versus Topical Heparin Application (C) on infusion induced phlebitis.

N=60

Variables	Number of observations	Groups		Time Effect	Group Effect	Time* Group Effect
		Topical Heparin Application Group (C)	Hot Fomentation Group (E)			
		Mean±SD				
Phlebitis Score	O1 (DAY1)	3.50 ±.509	3.50 ±.509	F=755.12 df=1.755 p=.000***	F=16.55 df=1	F=18.29 df=1.75 p=.000***
	O2 (DAY2)	2.33 ±.479	1.63 ± .615			
	O3 (DAY3)	1.27 ±.521	0.57 ± .568			

0.000***=Highly Significant

Table No. 3 depicts impact of time effect, group effect and time interaction with in groups and both groups, when all the interventions were compared with repeated measures ANOVA, it was analyzed that as per time effect phlebitis score was statistical significant at p value 0.000 with F value of 755.120. As per group effect, phlebitis score was statistically significant at p value 0.000 with F value of 16.55 ,there are significant changes on different observations with respect to group. As per interaction of time and group, phlebitis score was statistically significant at p value 0.000 with F value of 18.296.

Table No. 4 Evaluation of Infusion Induced Phlebitis In Hot Fomentation Group (E) and Toical Heparin Application Group (C)

	HOT FOMENTATION (E)		HEPARIN ©	
	N	%	n	%
Total not "improved"	Nil	00	Nil	00
Improved at 3rd day	Nil	00	Nil	00
Improved at 5th day	14	46.6	01	3.3
Total "improved"	16	53.3	29	96.6
Total	30	100	30	100

Table No. 4 depicts that overall effectiveness at the end point/ healing of phlebitis in the Topical Heparin Application group © and Hot Fomentation group (E) compared in homogenous sample. (V.I.P Scale). On the 5th day healing was achieved in 46.6% (14) subjects in the Hot Fomentation group (E) where as 3.3% (1) subjects in Topical Heparin Application apart from this 53.3% (16) subjects were improved upto score 1 and score 2 in Hot Fomentation group (E). On the other hand, in Topical Heparin Application 96.6% (29) were improved upto score 1 and score 2.

DISCUSSION

Hot Fomentation is efficient in the treatment of peripheral infusion induced phlebitis Pre-test and post tests were conducted in a sample of 60 patients. Findings proved that the pre intervention mean score of phlebitis was 3.50 and it was decreased to 1.63 on the 3rd day and 0.57 on 5th day of treatment with hot fomentation. These findings are supported by similar study conducted by (Vishwambaran N, 2011)[59] to observe the effectiveness of hot fomentation v/s cold compress for reducing intravenous infiltration. Pre-test and posttests were conducted in a sample of 60 patients. Findings proved that the pre treatment mean score of phlebitis was 7.2 and it was decreased to 0.70 on the 3rd day of treatment with hot fomentation. The results of present study shows that topical heparin application is also efficient in the treatment of peripheral infusion induced phlebitis which is supported by similar study conducted by Lee KN, Tae YS, (2006)[61] on effectiveness of glycerine magnesium sulphate paste versus thrombophob gel for reducing I/V infiltration in patients admitted in pediatric wards. The study was conducted on 40 samples (20 for thrombophob gel group and 20 for glycerine magnesium sulphate paste group). The results showed that before the treatment, majority (65%) of patients had grade II infiltration after treatment with thrombophob and 100% of patient "s infiltration had reduced to grade I infiltration. In second group majority (80%) had grade II infiltration after the treatment with glycerine magnesium sulphate paste 100% had grade I infiltration. The study concluded that both thrombophob gel and glycerine magnesium sulphate paste are effective in reducing intravenous infiltration.

CONCLUSIONS

On the basis of the findings of the present study the following conclusions were drawn.

1. Hot Fomentation is effective in treating peripheral infusion induced phlebitis on Day 3rd and on day 5th phlebitis score was statistically significant.
2. Topical heparin application is efficient in treating peripheral infusion induced phlebitis in children on Day 3rd and day 5th reduction in phlebitis score was statistically significant.
3. Hypothesis is rejected as evident from the study results.

REFERENCES

1. Uslusoy E, Mete S (2008) Predisposing factors to phlebitis in patients with peripheral intravenous catheter : a descriptive study. Journal of the American Academy of Nurse Practitioners; 20: 172-180
2. Abbas S and Shaw S. Complications of Peripheral Vascular Catheters and Intravenous Infusion: A Prospective Study. British Journal of Nursing. 2007. 16 (11):48-52.
3. Stokowski G et al (2009) The use of ultrasound to improve practice and reduce complication rates in peripherally inserted central catheter insertions: final report of investigation. Journal of Infusion Nursing; 32: 3, 145–155.
4. Macklin D (2003) Phlebitis, a painful complication of peripheral IV catheterization that may be prevented. American Journal of Nursing; 103: 2, 55-60.
5. Kohno E et al (2009) Effects of corticosteroids on phlebitis induced by intravenous infusion of antineoplastic agents. International Journal of Medical Sciences; 6: 4, 218-223.
6. Malach T et al (2006) Prospective surveillance of phlebitis associated with peripheral intravenous catheters. American Journal of Infection Control; 34: 5, 308-312.
7. Cicolini G Bonghi Ap Et al "Position of peripheral venous cathetere and the incidence of thromb ophlebitis an observational study" J Adv Nurs 2009 Jun : 65(6): 1268-73 EPUB 2009 Apr 3.
8. Cesare Vecchio, Anna Frisinghelli Topically Applied Heparins for the Treatment of Vascular Disorders Clinical Drug Investigation, 2008, Volume 28, Number 10, Page 603.
9. Journal of Infusion Nursing. May/June 2008 - Volume 31 - Issue 3 - p 182-188
10. Vilardell M, Sabat D, Arnaiz JA, Bleda MJ, Castel JM, Laporte JR, Vallvé C. Topical heparin for the treatment of acute superficial phlebitis secondary to indwelling intravenous catheter. A double-blind, randomized, placebo-controlled trial. Eur J Clin Pharmacol. 1999 Feb;54(12):917-21. PubMed PMID: 10192751.
11. Salgueiro-Oliveira A, Parreira P, Veiga P. Incidence of phlebitis in patients with peripheral intravenous catheters: The influence of some risk factors. Aust J Adv Nurs. 2012;30(2):32–9.
12. Yoong W, Tan J, Yeap JW, Sulaiha S, Aznal S. Risk factors of peripheral venous catheterization thrombophlebitis. 2012;6(1):24–30.

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